

# Rocket City Weather

National Weather Service, Huntsville, AL

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FALL 2011

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## April 27th: A Look Back

*Chris Darden, Meteorologist-In-Charge*

On April 27, an unprecedented natural disaster unfolded before us as over 60 tornadoes tore a path through the state. Not since 1925 has the loss of life been so great in a single day by tornadoes. In a blink of an eye, well-constructed homes were turned to rubble, trees were stripped of their bark, and churches and businesses were taken to the ground.

The National Weather Service has a mandate to protect "life and property," and we have worked diligently to do so for over a century. Technology has increased greatly in recent decades with Doppler radar technology allowing forecasters to

view the wind flow and rotation within storms, high-resolution satellite imagery that shows fronts and other features critical to tornado development, and computer models that better predict the evolution of weather in the upcoming days. In the days preceding what is now referred to as the 2011 Super Outbreak or the Southern States Outbreak, meteorologists became increasingly concerned about this being the "big one". Conditions, including intense wind shear, an unstable air mass, a surge of moisture from the Gulf of Mexico and a powerful storm system were coming

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## A Change in Leadership

*Jennifer Lee, Forecaster*

Amidst the turmoil surrounding the April 27th Super Outbreak, we welcomed our new Meteorologist-In-Charge (MIC), Chris Darden, into his role as office supervisor. Chris is no stranger to the Huntsville area, having served our office both as a senior forecaster and most recently as our science operations officer (SOO). Before moving to Huntsville in 2003, Chris served offices in Memphis, Lubbock and Burlington, Vermont.



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*Chris poses in front of a workstation.*

# April 27th: A Look Back

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together to produce an explosive environment for supercell thunderstorms.

Supercell thunderstorms are the genesis for long-lived, devastating tornadoes. A review of the forecasts, discussions and posts on social media in the days before the 27th revealed many forecasters comparing the setup to the outbreaks of Nov. 15, 1989, or "Anderson Hills '95." Sadly, even those dire predictions were well below reality. In fact, this event will go down as the most tragic tornado outbreak in modern times and will likely be the benchmark upon which all future research is constructed.

Enough about the science. Now more on the human impacts.

To prepare for the event, the National Weather Service office in Huntsville started briefing emergency managers, first responders and local media more than 48 hours in advance that this would be a major outbreak. Staffing was optimized with all available staff scheduled to work on the 27th.

In short, we knew it was coming. When I awoke at 4 a.m. on Wednesday, I looked at the radar on my phone to see storms approaching from the south and west and knew that it was potentially even worse than I could have imagined. If tornadoes were occurring at 4 a.m., what would the rest of the day hold? Upon arriving at work an hour later, initial damage reports were rolling in. Injury reports from Cullman County would soon follow. No matter how long you've done this job, nothing prepares you for some of the calls you have to take or some of the things you see.

As the first wave rolled through and the next wave began to move in from Mississippi midmorning, it was obvious there would be no breaks for the area.

Some locations were hit multiple times on April 27th; the same houses damaged in the morning and wiped clean in the afternoon. I talked to one man who was called to his home in east Limestone County after the morning storms and was busy tarping his house when the sirens blew again. A few minutes later he and his wife rode out the tornado in their shower, landing on top of a neighbors' pile of rubble. As we saw the "big ones," the final and most intense group of supercells beginning to organize across Mississippi and western Alabama, I think we all had that sinking feeling.

By early to midafternoon, conditions were optimal for long-track killer tornadoes. Everything on the radar was showing signs of rotation. First it was the Cullman storm. Confidence was high that a tornado was occurring, and there it was on the local skycam. The Hackleburg storm topped that off. In my 17-year career, I have never seen anything closely resembling the beastly display on radar as it moved through Hackleburg and toward Phil Campbell with winds of at least 200 mph. Forecasters often refer to a "hook echo" as a definitive sign of a tornado. This storm had a well defined debris signature where the radar was not picking up rain or hail, but was actually picking up large chunks of debris like roofs, plywood or trees.

That's when you know that things are bad. Let's be clear, we are all professionals and we all have a job to do. However, as this storm rolled through Mt. Hope and moved toward Tanner we were all visibly shaken.

Damage reports were slow to roll in and we knew why. Not because it wasn't a damaging tornado, but because there was nobody left to report damage. In our gut, we knew that there were mass injuries and very likely a large number of fatalities. We could only pray that our warnings, updates and diligent work could prevent this from being a complete catastrophe. Even after the storm rolled through Harvest where many of our staff resides,

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# April 27th: A Look Back

*...Continued from Page 2*

they continued to perform their duties professionally and without panic. As the next storm moved through Madison, my wife and daughter were in the tub when I lost phone contact with them. Next thing, reports start rolling in about damage at the intersection of Gooch Lane and Wall-Triana not far from where I live. But I still had a job to do. My staff and the people of the Tennessee Valley were also my concern, and we had to take immediate action to turn our own operations over to our sister office in Jackson, Miss., while we took shelter from the approaching storm. Thirty minutes later we were issuing warnings for Birmingham's area while they were taking cover from a tornado.

Additional supercells spawned tornadoes in parts of Jackson and DeKalb Counties through the late afternoon and early evening hours. Parts of Higdon, Flat Rock, Sylvania, and Rainsville were leveled by EF -4 to EF-5 tornadoes. In fact, areas along and near Lingerfeldt Road in Rainsville were completely devastated with the loss of life staggering.

By the end of the event, which spanned 17 anxious hours, the Huntsville office had issued 92 life-saving tornado warnings with an average lead time of 20 minutes. In the days that followed, our staff worked many 16-hour-plus days surveying damage, providing incident support to first responders, and just being there for the community. Our staff was fortunate as we had little damage as a whole, and no injuries or loss of life.

As I traveled our area from Tanner to Harvest to Huntland to Higdon to Oak Grove to Phil Campbell, I gained a greater sense of pride in our community with people helping strangers, stopping to hand out food, or providing a ride to a shelter. I also became frustrated by the lack of national coverage concerning the plight of

our communities. Many areas were devastated just as badly as Tuscaloosa, and a few may never recover.

The scenes of destruction are sobering even for a seasoned meteorologist. Seeing a house with anchor bolting completely obliterated in Oak Grove, or entire neighborhoods in northwest Madison County brought to the ground is horrendous. The scene along Rosie Road in Tanner was gut wrenching, and just walking down Brown Street in Phil Campbell was too much to bear.

The storm was so powerful there that it pulled the pavement out of the ground. But that's a mere sampling of the catastrophic damage that stretches for as far as the eye can see. But the stories of survival were also uplifting. I think of the many people who praised the warning system for saving their lives, and those who showed us their storm shelters and where they went to ride out the storm. We found a family of four in Higdon who somehow were left untouched in their house when everything else was swept clean around them. There wasn't even any rubble left and their propane tank barely missed them as it shot directly over their heads. Those are little pieces of joy and optimism in the large sea of despair.

Our communities have already started to recover and signs of rebuilding and regrowth are encouraging. Through it all, the National Weather Service will continue to work tirelessly to protect our citizenry when the next threat approaches.

# Winter Weather: Are You Ready?

*Jennifer Schuller, Forecaster*

Especially after last winter in the Tennessee Valley, it's important to think ahead and prepare for this upcoming winter season. Last winter we saw above normal snowfall (which is 2.5 inches) but there is no telling what we will see this year. The Climate Prediction Center's three month (December-February) probabilistic outlook for temperature and precipitation are an equal chance for above, near or below normal (see: <http://www.cpc.ncep.noaa.gov/>)

Taking a look back, last year a white Christmas was in store when snow began to fall early in the morning on the 25<sup>th</sup>, leaving 2 to 3 inches of snow behind across much of the Tennessee Valley. The major snow event occurred on January 9<sup>th</sup>-10<sup>th</sup> where even some thundersnow was reported in a few locations. Snow quickly accumulated leaving a large gradient of snowfall with amounts ranging as little as 2 to 3 inches in Cullman County to over a foot in parts of northwest Alabama. Due to the prolonged period of below normal temperatures, the snow stuck around for about a week. In fact, snow depth was officially recorded at the International Airport for 8 consecutive days which is a record for Huntsville!

One of the best ways to be ready this season is to be informed and up to date on current and future weather conditions. We issue different winter weather products depending on the expected severity of the storm and time until the storm begins.

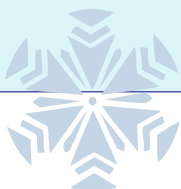
When you stay alert of the weather conditions, you are ahead of the game. The next step is to **be prepared**. One way is to make a vehicle kit that will be on hand if you ever need it in case of an emergency. A few items include:

Blanket  
Flashlight and batteries  
First aid kit  
Jumper cables  
Ice scraper  
Tow rope  
Shovel  
Road maps/GPS  
Sand or cat litter  
Water and non-perishable food  
Mobile phone and charger



## Tips and Tricks

- For lighter vehicles that do not handle the winter weather well on the roads, having a bag of sand or kitty litter in the trunk will not only help weigh it down, but when spread under the tires will help gain traction if stuck.
- If a door is frozen shut or if the windshield is full of ice, do not use hot water to get it free. It may not help because hot water could cause the windshield to crack.
- When the weather gets bad, do not guess the condition of the roads, sometimes it's just better to stay off of them. In fact, the January event was well anticipated so our forecasters planned ahead to camp out at the office!



# Winter Weather: Are You Ready?

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## *What is the difference between a Winter Storm WATCH, WARNING and ADVISORY?*

### **Winter Storm Watch**

- Issued to give advanced notice that there is at least a 50/50 chance that warning criteria ( $> 2$  inches of snow/sleet and/or ice accumulations  $\geq \frac{1}{4}$  inch) will be met
- Typically issued 12-24 hours before winter event
- Time to prepare for significant winter storm

### **Winter Storm Warning**

- Issued when a combination of snow/sleet or freezing rain is expected to create a life threatening situation
- Snow/Sleet accumulations:  $> 2$  inches
- Ice accumulations:  $\geq \frac{1}{4}$  inch
- Not always based on “accumulations”
- Sometimes issued when other significant impacts come into play (for example):
  - 1 inch of snow/sleet expected during rush hour with temperatures falling below freezing.



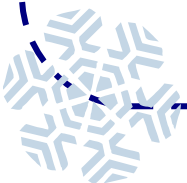
*A view looking toward Huntsville from the roof of the NSSTC building after one of the many winter storms to affect the Tennessee Valley during the 2010-2011 winter.*



*This photograph was taken by one of our forecasters during the January 2011 snowstorm. This is the parking lot of our building at the NSSTC building in Huntsville.*

### **Winter Weather Advisory**

- Issued when a combination of snow, sleet, freezing rain or freezing drizzle is expected to cause adverse travel conditions.
- Snow/sleet accumulations: up to 2 inches
- Ice accumulations:  $< \frac{1}{4}$  inch
- Still a significant winter weather event!
  - More of an inconvenience (i.e. accumulations expected but widespread hazardous road conditions are not expected)





# Decision Support: What is it?

*Stephen Latimer, Forecaster*

Recently, a decision support workshop was conducted by the National Weather Service (NWS) in Memphis, Tennessee. At this workshop a number of speakers related how the NWS is responding to assist and better serve our customers (i.e. public, first responders, etc.) during high (or not so high) impact events. Of particular note was the decision support provided by the NWS office in Slidell, Louisiana for the Deepwater Horizon oil spill, and the support provided by the NWS office in Memphis, Tennessee during the May 2011 Mississippi River flood.

In the aftermath of the Deepwater Horizon oil spill in 2010, you may remember that there was a massive cleanup effort involving up to 25,000 volunteers (at the height of the cleanup). However, in addition, there were multiple needs for weather support for marine interests (i.e. ships laying booms to catch the oil on top of the water). In some cases, though, fires were set to burn the oil off the water. All three of these examples required weather support, but due to the enormity of the disaster, on-site support (to the Incident Command Post) was needed to handle the workload to the federal and state partners involved. Even with this particular disaster, weather support was not initially requested as some of the government agencies involved were not aware of the weather expertise the NWS could provide in the aftermath of a non-weather related disaster. However, once they saw what the NWS could provide, they realized the value of having the NWS on-site. Though this initially placed an enormous strain on the staff at the Slidell office, they were able to receive assistance from forecasters across the NWS that were sent to help mitigate the workload on the office. Several services the NWS provided to the recovery efforts included: thousands of informal and formal weather briefings to the incident command post, forecasting for marine weather variables that had not been attempted before (i.e. fire weather spot forecasts on the water), and more frequent short-term forecasts with very specific thunderstorm development timing for the volunteers helping with the cleanup.

Though the Deepwater Horizon oil spill support was a non-weather related disaster, you might ask...what about the way the NWS might respond during a weather related disaster? Many cases could be cited, but the pertinent one for this workshop centered on the Mississippi River flood that occurred earlier this year, a couple of weeks after the April 27<sup>th</sup> tornadoes streaked across Alabama. Through coordinating with a number of federal (i.e. U.S. Army Corps of Engineers) and state (i.e. Tennessee Emergency Management) agencies, daily conference calls throughout the event were conducted by NWS Memphis with current and forecasted river stage levels. In one case, a formal on-site briefing was given by the NWS hydrologist to the county and city officials in Memphis regarding the impending flood threat. In addition, phone calls to the individual emergency management officials with current forecasts of the river stage were extremely important for the officials to make evacuation decisions.

Now that we looked at Deepwater Horizon and Mississippi River flooding, here are just a couple of examples that your local NWS office in Huntsville provides for decision support. The most recent example was providing decision support for Big Spring Jam (September 23-24) in Huntsville. We anticipate providing this type of support to large entertainment venues in the coming months. In another example, we gave daily briefings to emergency managers before the April 27<sup>th</sup> tornado outbreak and then provided almost hourly weather updates to them when any kind of shower and thunderstorm activity hampered the recovery efforts in the aftermath.

Therefore, if an incident occurs that may or may not have impacts from the weather, chances are the NWS might be involved along the way before, during, and after the event.

# Tropical Recap

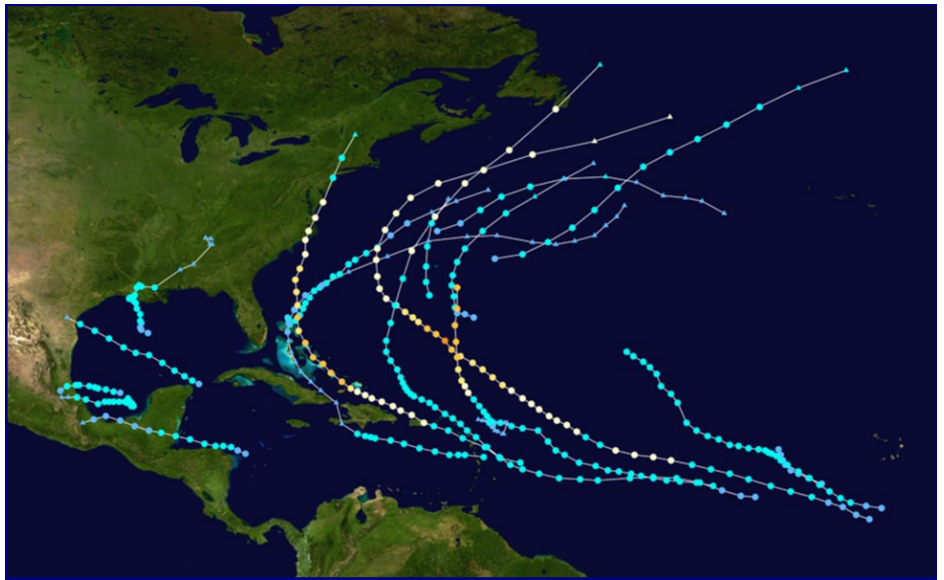
*Dan Dixon, Forecaster*

As predicted by meteorologists with NOAA earlier this year, the 2011 Atlantic Tropical Cyclone Season has been very active and is on par with the 2004 and 2005 seasons to be one of the most active on record. Although there is still some time remaining before the tropical cyclone season officially comes to a close on November 30, this season has already produced 18 named storms (12 tropical storms and 6 hurricanes), and one tropical depression that failed to achieve tropical storm strength.

The first named tropical cyclone of the season was Tropical Storm Arlene, which developed on June 29, 2011 and affected the Yucatan Peninsula before crossing the southern Bay of Campeche and making a final landfall near Veracruz, Mexico. The next seven tropical cyclones following Arlene were all tropical storms (Bret, Cindy, Don, Emily, Franklin, Gert, and Harvey). The first hurricane (and major hurricane) of the season was Hurricane Irene, which initially developed on August 20, 2011 from a large tropical wave as it moved through the Atlantic Ocean to the east of the Leeward Islands. Irene rapidly intensified to a Category 3 hurricane (with 120 mph winds) as it moved west-northwestward through the southern Bahamas, but weakened to a Category 1 hurricane (with 85 mph winds) before making an initial landfall in the United States at Cape Lookout, North Carolina. Hurricane Irene proceeded to move northeastward along the Mid-Atlantic coast of the U.S. and across coastal New England, affecting multiple states and large metropolitan areas, including Washington D.C., Philadelphia, New York, and Boston. At least 55 fatalities across the Caribbean Islands, the United

States, and Canada can be attributed to Hurricane Irene, with many of these the direct result of inland flooding. Furthermore, due to the highly populated areas that Irene affected, total damages may exceed 10 billion dollars.

Despite the high level of tropical cyclone activity this year, Hurricane Irene was only the second of three



*2011 tropical cyclone tracks, through 31 October.*

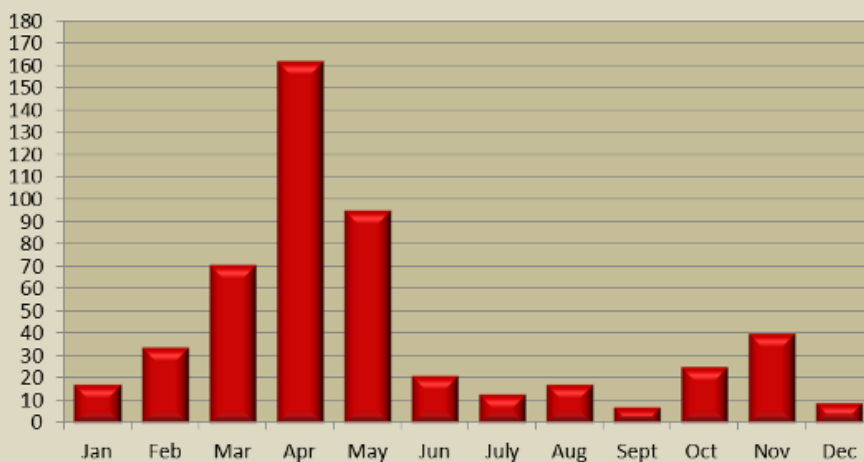
named tropical cyclones to directly impact the U.S., with the first being Tropical Storm Don (which made landfall in late July in South Texas) and the third being Tropical Storm Lee (which made landfall in early September in Southern Louisiana). Residents of the Tennessee Valley should remember Tropical Storm Lee very well as it doused the region with several waves of moderate to heavy rainfall during the second half of the Labor Day weekend, during its slow track across the southeastern states. Most locations in Northern Alabama and Southern Middle Tennessee received between 4-6 inches of rain, with some portions of Cullman, Marshall, Jackson, and DeKalb Counties in Alabama receiving between 8-10 inches.

# Fall Severe Weather: Always a Possibility

*Tim Troutman, Forecaster*

Several destructive and deadly tornadoes have devastated Alabama and Tennessee communities during the fall severe weather season over the past decade. In fact, during the months of October through December, tornadoes in the Tennessee Valley have occurred in 9 of the last 11 years. When you consider the broader “secondary severe weather season” (typically defined as the period of October through February), November is the most active month for severe weather and tornadoes. All told since 1874, there have been 124 tornadoes across Northern Alabama and Southern Middle Tennessee.

## Monthly Tornado Distribution Across the Huntsville Forecast Area 1874 - Sept 2011



### Nighttime Tornadoes

Nighttime tornadoes, or those roughly between the hours of sunset and sunrise, can be particularly devastating and life-threatening, and many in the Tennessee Valley remember the destructive 1989 Huntsville Tornado. Between the hours of 10 pm and 5 am, 31 tornadoes have occurred in the Tennessee Valley since 1874. This accounts for roughly 25% of the 124 tornadoes that occurred during the secondary severe weather season.

### Recent Fall Season Severe Weather Episodes Across the Huntsville Forecast Area

- **2010:** Numerous severe thunderstorms and a few tornadoes affected the Tennessee Valley during late October. One of these was an EF-2 tornado in Jackson and DeKalb counties.
- **2007:** Severe thunderstorms caused considerable straight-line wind damage across Northwest Alabama on October 18th. An EF-1 tornado tracked into southern Lawrence County, downing several trees in Bankhead National Forest.
- **2003:** A line of thunderstorms plowed through the Tennessee Valley on November 18th, resulting in significant straight-line wind damage. Remember, damaging wind gusts can be just as destructive as tornadoes.
- **2001:** Six of the eight tornadoes that hit North Alabama this year occurred with the November 24th outbreak. This event broke a record for the number of tornadoes that occurred during a 24-hour period in the state of Alabama (this record was again broken on April 27th of this year).
- **2000:** Two tornadoes hit the Huntsville Forecast Area. One was an EF-2 that hit Limestone County and a second EF-1 tornado hit the Cash Point area in Lincoln County, TN.



# New Smiling Faces in Huntsville!

## Staff Promotions and Additions



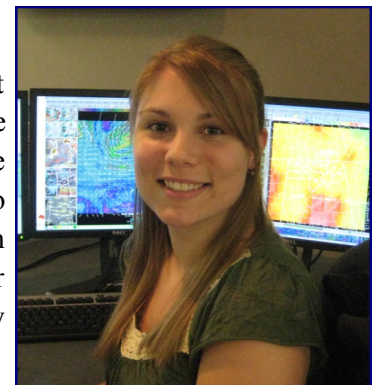
*Brian Carcione (top), Kris White (middle), Tim Troutman (bottom)*

When Chris Darden accepted the position of Meteorologist-In-Charge, there was a cascading effect of staff changes at NWS Huntsville since Chris was the Science Operations Officer (SOO). Former NASA Applications Integration Meteorologist (AIM) Brian Carcione accepted the SOO position, and former senior forecaster Kris White accepted the AIM position. Filling the senior forecaster position is Tim Troutman, who comes to us from NWS Morristown TN.

As the SOO, Brian's primary duties include serving as the principal and senior scientific advisor to the office staff. This includes being responsible for initiating, planning, coordinating, and overseeing the transfer of new and emerging scientific technologies and techniques from the research community to the operational weather forecast and warning environment.

As the AIM, Kris' primary duties include serving in a combined position, as a principal liaison forecaster between the NWS and the NASA SPoRT program, and as a senior forecaster. He is primarily responsible for shift duties when acting as a senior forecaster, and helps development of documentation on the use of NASA-derived information and applications in NWS operations.

Jennifer Schuller begins her career here in Huntsville as the newest Meteorologist Intern. She is a native of Plainfield, IL which was struck by an F-5 in 1990. The event and survival of her family inspired her to become a meteorologist. She graduated with a B.S. of Meteorology and a minor in Math from Valparaiso University in 2010. Volunteering at the Chicago NWS helped excel her passion for outreach and education programs, while working in North Dakota as a Radar Meteorologist heightened her interest for radar. Here in the office she is highly involved with the outreach, social media and hydrology programs.



## *A Change in Leadership...Continued from Page 1*

Chris has a wealth of meteorological research and development experience, is a frequent presenter at conferences and workshops, and specializes in lightning research and in the transition of new meteorological methods and techniques into operations and the warning decision making process. In the months since taking the helm, he has guided our office through the April 27th

Super Outbreak research and recovery process, providing strength and leadership.

All of us here at the office are thrilled with the selection of Chris as our new MIC and look forward to working with him for many years to come.

# Contact Information

*The NWS in Huntsville: Serving Northern Alabama and Southern Middle Tennessee*

National Weather Service  
Huntsville, Alabama

320A Sparkman Dr NW

Huntsville, AL 35805

Phone: 256-890-8503

Fax: 256-890-8513

[www.weather.gov/Huntsville](http://www.weather.gov/Huntsville)

Webmaster's Email Address:

[sr-hun.webmaster@noaa.gov](mailto:sr-hun.webmaster@noaa.gov)

Spotter Email Address:

[sr-hun.spotter@noaa.gov](mailto:sr-hun.spotter@noaa.gov)

## Reporting Weather

**There are several ways to report hazardous weather conditions such as hail, wind damage, funnel clouds, tornadoes, exceptionally heavy rainfall or flash flooding:**

1. **Call the office at 256-890-8503**
2. **Submit your report online**
3. **After the event, email pictures to:**  
**[SR-HUN.Spotter@noaa.gov](mailto:SR-HUN.Spotter@noaa.gov)**

**Timely reports can save lives!**

## Find us on Facebook!

About six months ago, the NWS office in Huntsville officially joined the Facebook community. On our page, you can find weekly trivia, daily forecasts displayed graphically, and other weather-related stories that we think might pique your interest. It's also a great way to submit a storm report, or ask a question. To friend us, either search for "US National Weather Service Huntsville" or use:

[www.facebook.com/US.NationalWeatherService.Huntsville.gov](http://www.facebook.com/US.NationalWeatherService.Huntsville.gov)



## Rocket City Weather

*Volume II, Issue II*

Contributors

*Chris Darden*

*Dan Dixon*

*Stephen Latimer*

*Jennifer Lee*

*Jennifer Schuller*

*Tim Troutman*

Editor-In-Chief

*Jennifer Lee*

[Jennifer.L.Lee@noaa.gov](mailto:Jennifer.L.Lee@noaa.gov)

Meteorologist-In-Charge

*Chris Darden*

[Chris.Darden@noaa.gov](mailto:Chris.Darden@noaa.gov)

